

Water and Culture

by **Drew Denzin**, Ololulunga, Kenya

My wife, Jen, and I are working with the Maasai community. Traditionally, the Maasai are pastoralists, or cattle herders, on land that is extremely arid. Often, they pray to the Christian God for rain for their small gardens consisting of maize and kidney beans.

The Maasai generally use milk for their main fluids; it is easier to get and cleaner than the nearby river. The river is used to clean their cattle as well as to water their cattle during the hottest parts of the day. Cattle are by far the most important aspect in the lives of Maasai men, so watering and cleaning them is vital—in fact, the water is used for the cattle more than for themselves.

One custom among the Maasai involving water deals with the penalty for killing another man: If a man kills another he must pay a fine of 49 cows as well as wade across a river. When he reaches the other side he puts on new clothes, symbolizing a fresh start.

by **Kendall Rondeau**, Miharati, Kenya

The Maasai believe that if you know five words or more in someone else's language, they can't refuse you drinking water. The Maasai are a pastoral people living in a very hot and arid land. To deny someone water could cause their death.

The Kikuyu people will not let a visitor leave their house without serving them chai. Chai is a tea made with water, milk, tea leaves and sugar. To refuse someone's chai is a rude insult.

Every time I go to someone's house, the woman of the house goes off to prepare chai. It is hot and sweet and fights off the chill of the rain and cold mountain air. No business can be done without chai. No guest can leave before at least two cups.

The Kikuyu say that rain is a blessing, as are visitors. If it rains while a visitor is at your home, it is a lucky day.

by **John and Kim Shumlansky**, Mount Kenya National Forest, Kenya

The people of Kangaita are mostly of the Kikuyu tribe. Over the years the Kikuyus have discontinued most of their traditional practices and ceremonies, but one water-related tradition is still remembered by the older members of the village.

The Kikuyus have long believed that rain is a blessing from God. The rains allow local food crops and the many tea plantations in the area to thrive. Without rain many people would have no food and no source of income.

Long ago during times of drought, the elder men in the village performed a religious ritual to pray for rain. The elders would select a special, hidden spot in the Mount Kenya forest where they would go to pray to *Ngai* (God). Before going into the forest, the men would spend time away from their family and friends. After this time of solitude, the older men would travel into the forest to their secret spot and pray. Everyone else in the village was forbidden from entering the forest during this time. Since it is believed that Mount Kenya is the "Seat of *Ngai*" the men would face Mount Kenya during the entire ceremony. After praying, the men would slaughter a sheep or goat of one color only as a sacrifice to *Ngai*. This ritual was then believed to elicit God's sympathy to bring rain to the people.

A famous book by Jomo Kenyatta, the first president of Kenya, is entitled *Facing Mt. Kenya* and describes similar beliefs, rituals and ceremonies by the Kikuyu people over the years.

by **Melissa Perry**, Oyugis, Kenya

The only religious ceremony I can think of pertaining to water is baptisms. In many local churches, people still go down to the river to be baptized.

by **Bryce Sitter**, Mobile Clinic, Kajiado, Kenya

The value of water is top priority for the Maasai. Everything they need or use comes from the cow; the dung is even used to construct their homes and is often a fuel source. The Maasai live off of blood, milk, and meat, and will spend the day taking the cows to graze and then to water. Most live near a water source. If the source dries up, they will knock down their *boma* (home) and move to an area where there is water. They have ceremonies for moving, coming of age, naming people, and the "Empolosare" Rain ceremony. This Empolosare ceremony consists of sacrificing a good animal (of a solid color) and singing and dancing.

The Maasai stun me as they stand the whole day under the hot sun without having access to water. I never leave my house without a bottle of water, but they follow their herds across the plains without worry. In their prayers the Maasai pray for rain for their animals, rather than for themselves. The women are the only ones allowed to pray for water for human consumption.

by **Barbara Hinsman**, Vigeze Village, Vihiga, Kenya

Water plays an essential role in the quickly disappearing traditional circumcision ceremonies of the Maragoli people. The ceremonies take place every 10 years and involve any young boys who are nominated by their fathers, usually between the ages of 5 and 15. On the night of the circumcision, the boys are taken down to the river by the village elders and covered entirely with mud. The actual circumcision takes place at the river, and then

the boys are taken to a hut in the forest made out of twigs and grass, where they stay together for one month, still covered in mud. Mamas bring them food and water, but otherwise the boys are not allowed to have any visitors. This month is for healing and meditating on what it means to be a man. When the month is over, the boys are then taken back to the river to wash themselves completely clean of the mud, a symbol of washing themselves from boyhood. After the final washing, there is a huge celebration in the village with food and water, dancing and singing to celebrate the boys' entry into manhood.

Many cultural uses of water are dying quickly as Kenya becomes westernized. One of these dying traditions acted as a mother's test for her son's chosen wife. The mother would give a clay pot to the girl to go fetch water from the river. If the girl returned with a broken pot and no water, she was not accepted by the mother to be the son's wife and another girl would have to be chosen.

The making of clay pots is one of the only art forms of the Maragolis which has not died out completely. Traditionally mamas and girls used these pots to fetch water from the river, but these days they are 20-liter plastic "jerry cans," which do not break so easily. Clay pots are now kept in the home for water storage. Since the pots keep any contents very cool, many people use them as a form of refrigeration. Boiled water is stored inside to be used for drinking and cooking. Some people even store containers of milk in the cool water, and the milk can be kept fresh for days.

Maragoli children like to sing songs while they work. One such song is traditionally sung while fetching water at the spring or river. It is the story of children who, while fetching water, run into a monkey. They ask the monkey to fetch some water for them, so they can play instead of doing their work. The monkey returns with dirty water, however, and the children respond by throwing the dirty water on the monkey. They then go and fetch clean water for themselves to take home to mama.

by **Patrick Campbell**, Mombasa, Kenya

In all of Kenya rain and water are central issues. When Kenyans greet each other there is an exchange of question about life, family, work. And "in the bush" one of the questions at the top of the list will often be, "Is it raining in your area?"

Rain is considered a blessing from above. Many of the tribes or ethnic groups have a designated rainmaker—"mganga wa fula," or "magician of rain"—here on the coast. After the planting is finished, rituals and ceremonies are performed to bring the rain. Rainmakers are also called upon during times of drought.

by **David Frommell**, Bagoo, Rift Valley Province, Kenya

Blessing from an Mzee (Elder)

When a young couple from the Kipsigis tribe of Kenya wish to marry, they arrange a ceremony along with their parents; much time and money is invested in the event. Traditional and modern elements mix during the ceremony, providing a colorful and fun-filled day.

The oldest man in the village, called an *mzee* (mm-záy), will bless the young couple. He selects a gourd of high quality in which to mix the blessing elixir. As the *mzee* hollows and decorates the gourd, community members prepare the ceremonial brew. Maize meal mixed with water is buried for three weeks to ferment. When it is ready, it is roasted and mixed with fermented millet and water to complete the drink.

On the wedding day, the *mzee* fills his gourd with water and a small amount of milk. He sets the gourd aside as he dresses for the wedding. He wears traditional clothing, including cowhide, a wool cap, and a cow-tail fly swatter.

The wedding ceremony itself begins with Christian celebrations. The bride and groom are given a blessing. First, they sit and drink traditional brew from a clay pot using long, wooden straws. The group then begins to dance. The *mzee* now takes a mouthful of the water-milk mixture from the gourd. He approaches the couple and sprays them with the mixture from his mouth. After blessing the couple, the *mzee* continues to bless the entire community in the same manner. Only then is the ceremony complete.

by **Glenna Snider**, Osorongai, Kenya

I live among the Nandi people (one of the Kalenjin tribes). There is a lot of water in my area in the form of rivers, streams, and springs. Unfortunately, it is mostly contaminated, since little effort is made to keep the livestock away from the water source.

The Kalenjin are primarily concerned with raising livestock; they value milk highly. If you are invited into someone's home, and they do not offer milk to drink, it is considered to be an insult.

During the month of December the young men who will partake in the initiation ceremony (entry into manhood) disappear into the bush for the whole month. They usually stay close to the river, as the foliage is thick and provides excellent cover. They do not want to be seen by anyone during the initiation period.



The Source of Our Water

by **Drew Denzin**, Ololulunga, Kenya

We have two sources of water: rain and the nearby river. We try to collect as much rainwater as possible through gutters and tanks by our house. There are two rainy seasons, a long one (2–3 months) and a short one (1–2 months), and during those times water is abundant. However, due to climate changes, the seasons have shortened: For six to eight months of the year, it is extremely arid. During those times we must have water brought from the river on donkeys. This water is extremely dirty and requires the use of alum, a substance that when added to water causes the dirt particles to settle to the bottom of the tank, giving us semi-clear water. The water from the river is polluted with human and cattle waste, pesticides, and general garbage. It must be cleared with alum, boiled, then filtered again. The rainwater is clearer but still requires filtering and boiling before drinking. The general availability of water is low, which affects our ability to wash clothes and bathe during the dry months.

by **Kendall Rondeau**, Miharati, Kenya

I live in an area rich with water. My town is called Manjohi and is located above 8,000 ft., along the western base of the Aberdare Mountains. This is a high area, rich with many flowing rivers and fertile soil. The water pours down from the Aberdares, a protected national park, and is cold, clear, and clean. Many people drink it untreated, but I always purify mine. It tastes delicious!

Many of the farmers have joined in water projects bringing piped water to most farms. Although it is expensive, this piped water greatly reduces the time it takes to fetch water from the river. I live in a health center compound. We have piped water in the clinic and in the staff housing. Those who don't have piped water must go fetch it from a nearby river.

It rains three quarters of the year. Our dry months are from December to March, during which the water table drops, but we are never without. Many people also use roof catchment systems. Rainwater flows down the sheets of tin roofs into gutters that funnel the water into storage tanks. This seems to be the most environmentally sound way of collecting water. Unfortunately, with the ever-increasing deforestation and global climate change, this area is experiencing less and less rain.

by **John and Kim Shumlansky**, Mount Kenya National Forest, Kenya

The village of Kangaita (pronounced kan-guy-EE-ta) is located on the southern slopes of Mount. Kenya, the second highest mountain in Africa. Because of Kangaita's proximity to the mountain, it has plenty of rain and many nearby streams that run off the mountain.

The people of Kangaita, including us, obtain water from a small stream inside the Mount Kenya National Forest. In 1998 the community obtained funding from the Peace Corps to build a water collection structure and a 2-km pipeline that brings water from the forest stream to our village of 250 people.

The quality of our water is fairly good. Since the source of our water is above human settlement and animal grazing it stays relatively clean and clear. The only time the water becomes very dirty is when the forest elephants decide to bathe in the stream above our intake structure.

The water supply is more than we can use. The heavy rains and melting glacier on the top of Mount Kenya provide an uninterrupted, year-round supply of water.

by **Melissa Perry**, Oyugis, Kenya

In my town water is easily accessible and available because of businesses the local people have made out of water supply. There are many individuals and groups who provide this service. They go to the river or spring to fetch the water, then bring it to town to sell. The cost is about 15 shillings for two 20-gallon jugs of water. Many people also have built roof catchment water tanks by their houses. The supply of rain is fairly good, except during the very dry season (December and January).

In a typical day I use about 6 gallons of water—2 gallons for bathing using a cup and a bucket, 1 gallon for drinking, 1.5 gallons for washing dishes, 1.5 for cooking. On laundry day I use about 25 to 30 gallons of water. With my laundry water I clean the floors of my house. I catch rainwater in a bucket to water my flowers and plants. I don't have a toilet so therefore I don't use water for flushing. I have a *choo* (a pit latrine in an outhouse).

by **Bryce Sitter**, Mobile Clinic, Kajiado, Kenya

As the crow flies, my home of Kajiado is about 175 km from the largest mountain in Africa, Mount Kilimanjaro. The Noulouresh spring comes from that mountain and is pumped through underground pipes. This is our main source of water, but unfortunately the output here in Kajiado is very small. People, businesses, and factories in villages along the pipeline have spliced into it so much that we only get access to water for two or three hours a week, sometimes less. Recent enterprises like flower farms, chicken farms, and a cement factory exploit the water that was intended for domestic human use. When the water comes through the tap, everything is dropped and people run for buckets, bowls, and anything that holds water. It is often chaotic and fights do break out.

We try to reuse water to conserve in any means possible. I use my water from hand-washing clothes or dishes to clean the table or floor. We can't grow vegetables or even flowers. Underground estuaries lie 250 meters below ground and through bedrock, so we can't dig wells. Water is a major concern for people. I am constantly thinking about water

here. If you can speak seven words in someone's language, however, they cannot deny you drinking water.

We get an average of 502 mm of rainfall a year. In one year and two months here, I have felt rain only seven or eight times. Rain fills pans and dams, which are used to water cows. This is 4 percent of our water supply; 27 percent of our water is now from dug boreholes or wells; 70 percent of the supply is piped. A few people try catchment but with little luck. Due to high temperatures during the day, the evaporation rate is very high. Ninety-five percent of surface water is seasonal and very unreliable.

by **Barbara Hinsman**, Vigeze Village, Vihiga, Kenya

Although my house in Kenya has pipes, this does not guarantee that water comes through them. I live in Western Kenya's Vihiga District, which is one of the most densely populated areas of the world, with more than 110 people per square kilometer. Therefore elements of infrastructure in Vihiga, such as piped water systems, which were built in the past, are no longer adequate to supply the exploding population. The solution? Ration water by days. Mine is supposed to come for a couple of hours on Wednesday and Friday mornings, but it rarely comes on schedule, if at all.

On a "water morning" (whether it is scheduled to come that day or not) water trickles slowly out of one tap in the backyard. Pipes leading to the kitchen and bathroom stay dry, due to low water pressure. I must remain at home these mornings and collect as much water as possible to store in plastic containers, for I have no way of knowing when it will come again. Tap water looks, smells, and tastes clean, but still I boil and filter it before drinking, just to be safe.

If the tap stays dry much longer than a week, I must resort to collecting rainwater. Luckily Vihiga is a high potential area—it rains here most months of the year. I have spent many evenings eagerly watching the sky, hoping that the rains will come to fill my basins. Rainwater that runs off the overhanging roof is noticeably dirtier than the tap water, but after boiling and filtering, it is potable.

During the dry season (December to February), both tap water and rain are difficult to come by. My plastic containers run dry. Simple tasks like cooking, and washing dishes and clothes must be postponed so that I can ration the little water I have between drinking and bathing. As a last resort, I must buy water from the mamas who fetch it at the river. This water can be used around the house, but I will not consume it. One time the water I received from the river smelled like gasoline.

by **Patrick Campbell**, Mombasa, Kenya

Mombasa is an island in the Indian Ocean populated by about 500,000 people. Living at almost sea level surrounded by the ocean means that the water in our water table is saline. As a result our water must be piped in from the mainland. Most of our water comes from Mzima Springs, in Tsavo National Park (about 200 km away). From there it is piped to Mazeras (about 20 km away), where it is treated at the reservoir. While the water is generally considered safe, many people, like me, take the precaution of boiling the drinking

water. Water vendors offer another source of water as well. They push a cart around town selling 20 liters of water (usually tap water) for between five shillings (7 cents) and fifty shillings (67 cents), depending on how scarce the water is at the time.

I am one of the lucky Peace Corps Volunteers who have running water, although it is not as reliable as one would imagine. In fact, as I write this I have been without water for two days. This is common throughout Kenya, so people have adapted methods to compensate. The building I live in, for example, has tanks on the roof that fill when the water is working and we store it until the water is not coming through the pipes for whatever reason. These tanks are connected to the plumbing in the building and help maintain a more constant water supply. However, if the water does not come back on within a few hours the tanks are depleted and the residents of the building are left to find their own sources of water until the piped water returns. Many of the people, myself included, have plastic barrels that we fill when the water is on. We can use that when the water is off.

by **David Frommell**, Bagoo, Rift Valley Province, Kenya

The people of Kericho District in Kenya's Rift Valley Province enjoy an annual rainfall of 1,000 mm to 2,000 mm, the equivalent of 3.25 to 6.5 feet. In fact, rain falls every day in Kericho, usually during the afternoon. The hilly topography of the district results in continual flow of many small- and medium-sized rivers. Kericho Town draws its water from one of these local rivers. The water intake is located in the Mau Forest, one of the few remaining natural forests in Kenya. From the intake, pumps drive water to a modern treatment facility. Kericho is one of the only towns of its size in Kenya to employ such a treatment works.

My house, located near Kericho Town, is supplied with piped water from the treatment system. The water flows clear and cold and tastes pure. Despite the good water quality at my home, I boil water for drinking to ensure that all pathogens are deactivated.

Kericho District has abundant water resources. The government Ministries of Health and Water supervise development of water resources. Community water supplies throughout the district incorporate rivers, wells, springs, and rooftop rainwater collection to ensure enough clean water is available to community members.

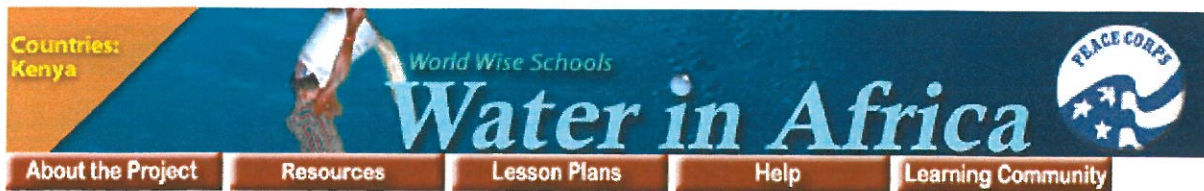
At times, the volume of water in Kericho District causes problems. El Niño rains during 1997 contributed to the degradation of many roads within Kericho. Standing water creates explosions in the numbers of mosquitoes and subsequently, in the number of malaria cases. The people of Kericho District will continue to be challenged in future years to develop their water resources in a positive manner.

by **Glenna Snider**, Osorongai, Kenya

The water that I use personally is collected in a concrete tank. It is rainwater, which is directed into the tank by gutters. I filter the water, then boil it before I drink it. I use the rainwater directly from the tank just to wash dishes and clothes.

Most of the people in my location cannot afford a water catchment system (gutters and storage jar or tank), so they use the water from the rivers, streams, springs, and dams. As a result of not boiling the water before they drink it, there are many cases of waterborne diseases.

During the dry season (December through March), my tank was also dry. I had used all the water, and there were no rains to fill it. I used a wheelbarrow to transport the 20-liter containers of water from the nearby dam. I could not carry the container on my head, as the women do!



Daily Usage

by **Drew Denzin**, Ololulunga, Kenya

Our daily usage of water is extremely low compared with use in the United States. We have no running water and no flushing toilet, so we conserve quite a bit of water. In the morning, we brush our teeth using one cup of water, wash our faces with about two cups of water (we both use the same water), and are off to school. At school there also is no running water. Tea is served at 11 a.m., then we are home for lunch. We drink water (or Kool-Aid) with lunch, then return to teach. At night we cook with water (boiling noodles, rice, etc.) as well as boil water for bathing. We take the boiling water and add cold water until it is nice and warm, then splash-bathe using three gallons of water each. We collect the bath water and kitchen water in buckets to use it for watering our garden, so we reuse as much as possible.

Our community is much like us in terms of water usage. Our neighbors may go to the river to bathe or wash clothes. Water is scarce and it is safer to drink soda or tea rather than the river water. Everyone relies on rainwater for watering crops, and only the rich can afford to collect and store rainwater for personal use.

by **Kendall Rondeau**, Miharati, Kenya

Water here is precious. Yet people still continue to waste it. They seem to feel that—since there are so many rivers flowing year round—it's an unlimited source. They aren't thinking of the people downstream who are suffering because those up stream are taking too much.

I have tap water and a flush toilet. I find myself using a lot of water because I have a constant (and easy) source. We use water here just as in America—for drinking, cooking, cleaning dishes, laundry, and cleaning the house. We also use water in our garden to keep our vegetable and tree seedlings alive when there's no rain.

There are times when water from the tap does not come. That's when I put on my big and bulky gum boots and walk down to the river. I scramble down the muddy bank and get in the river. I can feel the cold temperature through my boots. I ladle pots of water into the 15-liter jug (*mtungi*) until it's full. Then I struggle back up the bank with the heavy *mtungi*. I huff and puff the short distance to my house while my amused neighbors smile at me. I've found that I can survive on much less water when I have to fetch it—it is such tiring work. I use one bucket of water to wash dishes and another to rinse. That water can then be used to water the garden or soak dirty clothes!

by **John and Kim Shumlansky**, Mount. Kenya National Forest, Kenya

The water in our area is plentiful and thus we do not spend a lot of our day collecting, carrying, or conserving water. We have a tap that brings water directly into our home, and so we can wash clothes, water plants, and clean the dishes and the house using little of the day engaged in obtaining water.

Although the community water source is fairly clean, the stream could still contain bacteria and other microorganisms that can cause disease. We therefore drink and cook only with rainwater that we collect from the roof of our home. We collect the rainwater in a tank and then carry it inside where we boil and cool it before drinking. Most people in our village do not have rain tanks, so they must rely on the water systems as their only source of water. Some of the villagers boil their drinking water, but some are confident enough to drink right from the tap.

Our school gets its water from a piped water system similar to the one in Kangaita. The source of the water is a stream that runs through a neighboring community. The water is therefore much dirtier, often dark brown, and more likely to contain disease-causing organisms. Students use this water for cleaning purposes and bathing, but normally walk to a nearby groundwater source to collect the much cleaner water for drinking.

by **Melissa Perry**, Oyugis, Kenya

Before I came to Kenya to live as a Peace Corps Volunteer, I never gave much thought to the water I used in the States. I just knew that if I needed water, all I had to do was turn on the faucet and there was safe, clean drinking water. Since I've come to Kenya, I understand more clearly what a luxury it is to have clean running water. In Kenya, I get my water from a spring. If there hasn't been much rain, the water comes from a river nearby. I pay a boy 15 shillings (about 20 cents) to fetch the water from the spring. He brings the water in two 20-gallon containers; the containers are placed on the back of his bicycle. The bike ride from the spring to town where I live is about two miles. He does this job every day and he makes around 10 to 15 trips a day. Therefore he earns around 150 to 225 shillings a day, which equals around 2 to 3 dollars. After I receive the water, I have to boil it in order to have drinking water. Most people in my town get their water this way.

by **Bryce Sitter**, Mobile Clinic, Kajiado, Kenya

At a nearby technical school, students can learn a trade—metal work, plumbing, or carpentry. They live in dormitories, as they might in the States, but here they are given one to two buckets of water in a week. Imagine how much water you use to bathe, wash your clothes, drink, and keep your dorm clean. The terrain is very dry and dusty. We have dust devils (miniature tornadoes) that spin through town and throw a dry "moon dust" everywhere. The soil is red and dirties clothes quickly. I reside at the district hospital, where we can clean only once or twice in a week due to water shortages. There are no toilets that can be flushed, and sanitation is a major problem. We use heavy solvents and cleaners to clean blood, sheets, and pit latrines. If you come to the hospital to deliver a baby or get stitches, you bring your own water. When you go to a restaurant, you often don't get the option of washing your hands before you eat. A simple pleasure is taking my Friday

night splash bath. I use less than a pitcher of water to wash my whole body, while standing in a large tub to collect the dirty runoff water. People sell water when they have access to a vehicle and can go to the next town and get it.

The only plants that can grow here are the heartiest trees and bushes. Acacia Euphorbia and others have sharp needles or poisons that act as defense mechanisms against camels and goats. The animals too are very tough, and somehow survive on very little nourishment.

by **Barbara Hinsman**, Vigeze Village, Vihiga, Kenya

The rising sun wakes me at 6:30 a.m., and I walk drowsy-eyed into the kitchen. I find a large pot on top of the gas stove and congratulate myself for remembering to boil water last night for drinking today. I toss this water into the filter and put about two liters more on the stove to heat for bathing. I also put a small kettle on to boil water for my morning cup of coffee.

Noticing that both of my 50-liter water-storage containers are quite low, I check the backyard tap to see if by chance any water is trickling into the 20-liter plastic "jerry can" I can usually leave underneath the spigot. No luck. Today is Friday; tap water has not come in a week. Even worse, rains have been scarce. I guess my mountain of dirty clothes will just have to remain one more day, since it will take at least 20 liters to wash them by hand. What little water I have must be saved for drinking and bathing. But the distant clouds in the east give me hope that the rains might come this afternoon. If not, I'll have to pay a mama to go to the river for me tomorrow.

I remember the day I tried to fetch water for myself from the river and I laugh. That is exactly what the mamas did, too, when they saw me struggling miserably to carry a full jerry can of water home. One mama offered to carry it for me, and I couldn't refuse. She lifted it up to her head as if the thing were empty and balanced it so effortlessly! Since that day I have preferred to ask these mamas for help, having realized that it's probably not best to spend all day killing myself trying to accomplish what they can do in 10 minutes.

After bathing and eating breakfast, I head off to work. My only scheduled appointment today is an hour's walk away with a farmer named Joseph. Joseph started a small tree nursery recently so that he could plant some trees on his hillside farm to prevent soil erosion during the heavy rainy season. Already erosion has swept away most of his nutrient-rich topsoil, resulting in a harvest insufficient for Joseph to feed his own family. I had instructed him earlier on how to construct the seedbed, and I had even given him some seeds of indigenous trees. Unfortunately, I arrive today to find that all the seedlings are dried up and dead. Joseph has made the single most common mistake among the farmers I work with—he has failed to water the seedlings every morning and evening. "The river is so far," he complains to me, sounding very discouraged. I suggest that he move the nursery closer to a reliable water source, or share the nursery with another interested farmer who lives near the river. Delighted by my idea, he decides to try again. We agree to meet again in a few weeks' time.

On my way home I meet Brenda, the seven-year-old daughter of my friend Zibborah. Brenda is carrying a bucket of water from a local spring, and she looks very tired. No wonder! The very steep path between the spring and her house is severely eroded and

difficult to navigate—especially while balancing a bucket of water on her head, I imagine. Brenda explains that this is her sixth trip to the spring today, because Fridays are clothes-washing days.

I follow Brenda home to greet Zibborah, who seems very happy to see me. She claims she is fine but then complains about the lack of rain and how it is ruining her maize crop. Instinctively we both look to the eastern skies and agree the rains will come today.

Zibborah graciously invites me in for lunch. Before eating she brings a pitcher of warm water, a basin, and some soap, and she pours the water over my hands as I wash them—a Kenyan ritual before and after every meal. After lunch she offers me some drinking water. Refusing politely, I explain that I have carried my own boiled water so that I do not get sick. Zibborah is not offended, and we discuss at length the importance of clean drinking water. After hearing my opinions, she decides that from now on she will be boiling her water to protect her family from waterborne diseases.

The darkening sky and cool winds cue me that it is time to make my departure. If the rain comes while I am here, I'll be stuck until nighttime! I continue my trek home with a bounce in my step, silently thanking the forces that are responsible for bringing us the coming storm. Finally my clothes will be clean! I assumed the farmers are just as grateful as I, for the thirst of their crops, their only sustenance, will be quenched today. I ponder the necessity of rain for survival here in Kenya. Never before has rain played such a direct role in my own survival. This realization hits me just as the first large, cool drops begin pelting my arms and face.

I reach my front door just as the downpour begins. Once inside, I grab all my basins, pots, jerry cans, and other containers. I take them outside and place them in strategic spots under the roof where rainwater falls plentifully—I need to collect as much water as possible. Finally, I sit by the window to rest and watch the storm cool off the scorching land. I make a quick mental note: remember to boil water again tonight for drinking tomorrow.

by **Patrick Campbell**, Mombasa, Kenya

The first thing I do when I wake up is to check whether or not I have running water. If I do, I fill my three-liter kettle and put it on my kerosene stove to boil drinking water for the day. And, if I have water I can shower. Otherwise I use water from my 100-liter barrel, taking three liters to boil and about five liters to "splash bathe." I pour the five liters into a basin, wet myself down, soap myself up, and rinse myself off. The key is to avoid getting soap in the water, otherwise you're stuck with soap in your eyes, trying to get water out of the barrel without getting soap into it and polluting your only source of water (until the water comes back on). A very delicate operation, especially if you can't open your eyes.

I use water for many of the same things I did in the United States (drinking, bathing, washing clothes and dishes, and cleaning my house). The difference is that I use about one-fifth of the water for each of these tasks as I did in the States. For example, I can hand-wash a load of clothes with about 10 liters of water, quite a bit less than my washing machine at home would use. There are days though, when I have sores on my knuckles from hand-scrubbing clothes, that I still miss the washing machine.

by **David Frommell**, Bagoo, Rift Valley Province, Kenya

6:30 a.m.: The alarm clock screams above my head in harmony with the rooster outside my window. I groan and hit the snooze button.

6:38 a.m.: This time the alarm clock convinces me that I must get out of bed. I shiver in the chill morning air as I make my way to the bathroom. I use the toilet, but I won't flush until this evening, to conserve water. I turn the handle on the faucet until the water begins to flow, just as it does every day. A splash on my face to open my eyes, and a splash on my toothbrush. Not yet feeling awake, or alive for that matter, I stumble into the kitchen in my boxer shorts and slippers. I pour some boiled water into the coffee maker and fill the teakettle from the faucet. I place both of these on the stove to heat.

7 a.m.: After taking my coffee, I pour the hot water from the kettle into a basin for bathing. I add cold water until the temperature is right, and I step into the bathing room for my splash bath. Five to six liters (1.5 gallons) is enough to make me feel and smell clean. After dressing, I fill a one-liter Nalgene bottle with boiled water to carry with me for the day. Most of my community members don't boil drinking water, as they can't afford the fuel (charcoal, wood, or gas) to do so. I pack my day bag, most likely forgetting several important items, and mount my bike to ride the three kilometers (1.8 miles) to town and my office.

10 a.m.: I attend several meetings with my coworkers to make plans for seminars and field trips. Afterward, I sit at a crowded table in the Sunshine Hotel, a local restaurant. The waiter mixes hot water and milk in my cup and drops a teabag into the cup to steep. I walk to the basin and wash my hands before eating my midmorning snack. A pitcher of water rests on the table for drinking. I prefer the boiled contents of my Nalgene bottle.

10:30 a.m.: I board a local bush bus, which is really a pickup truck with seats in the bed, and pay 20 Kenya shillings (25 cents U.S.) for the 15-minute ride to Chebowu, a small market center southwest of town. The bus enters the last gas station before leaving town. An attendant opens the hood of the old, rusted vehicle and pours cold water down the gullet of the thirsty radiator. We are on our way.

10:45 a.m.: I join my coworker Rose Ngina, on the three-kilometer hike from the asphalt road to Kaptongeno, where a group of farmers awaits our arrival. Along the way we pass a mama carrying a 20-liter jug of water on her head. She has come from the nearby stream. Another kilometer later we overtake a donkey pulling a cart loaded with water jugs. The remainder of the morning will pass before the water reaches its destination.

11:30 a.m.: We begin a meeting with the group of farmers, who plan to build a water storage tank. The group already manufactured and installed two hydraulic ram pumps in the local river, along with several kilometers of piping and three distribution points (taps). We plan and assign tasks for the proposal-writing phase of the project. The main pump is clogged with debris carried by the river, so today the mamas fetch water from the river manually.

1:30 p.m.: Hoping to avoid the afternoon rains, I leave the group to return to Kericho for lunch. A passing bush bus stops and carries me back to town. I pay a visit to a friend who

owns an auto spares business. He offers me lunch. Stepping to the back of his shop, I wash my hands at the spigot. A slug of boiled water after eating helps to wash down the midday meal.

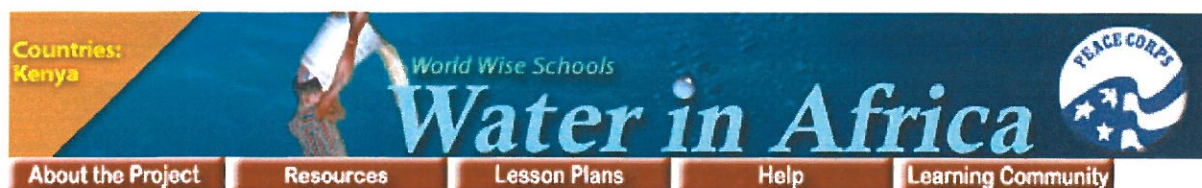
3:30 p.m.: After several more meetings, the time has come to bike home. With a pack full of fresh fruits and vegetables for dinner, I climb the hill toward home. I smell rain on the wind, and the large, black clouds ahead to the right close fast upon me. I pedal furiously; at 7,200 feet above sea level, the rain in Kericho falls cold. Moments before I arrive at my gate, the first drops strike my arms and face. The security guard lets me in, and the dogs sniff at my bag. Speeding down the hill to my house, I arrive just in time. As I step into the sitting room, the sky opens up, releasing a torrential downpour. The electric company cuts the electric service to avoid damages due to lightning and high winds. After lighting the lantern and a candle or two, I prepare another cup of coffee and sit down to record the day's events. Glancing at the calendar, I check the plan for tomorrow: laundry day. All to be done by hand, of course, in the same basin I bathe in.

10 p.m.: After a dinner of falafel and hummus, I wash up and brush my teeth again. I fill one last glass full of boiled water in case I wake up thirsty during the night. The rain has stopped, and the only sound tearing the utter silence of the night is the occasional barking of a dog. I fall asleep reluctantly, knowing that there will be plenty of water for tomorrow's laundry.

by **Glenna Snider**, Osorongai, Kenya

I live and work in the same location. I live in the interior. There is no electricity, no piped water, and very few latrines. Most of my time is spent visiting homes and schools in my area. I talk with people about the importance of clean water. The best way to teach is by example. Many of my neighbors are curious about me and my habits, so they closely observe everything I do and ask a lot of questions.

I am careful with how I use water. When the dry season is approaching, and my tank is no longer filled by rainwater on a daily basis, I start using the rainwater for cooking and drinking only (after I filter and boil it). I use the water from the dam for washing and bathing.



Managing Water

by **Drew Denzin**, Ololulunga, Kenya

No one is in charge of managing our local river; they all fend for themselves. People can take as much as they can carry, and bathe or go to the bathroom in the river whenever they want. In terms of families, it is the women's responsibility to get water for their families, wash clothes at the river, and do the cooking with the water.

Farmers pray for water when crops are planted; other than that, there isn't anything they do (i.e., irrigation or sprinklers with river water).

by **Kendall Rondeau**, Miharati, Kenya

In Kenya, water is considered women's work. Women and girls fetch water from the rivers. They do all the cooking and cleaning. They wash the whole family's clothes by hand. They heat the water for bathing and prepare it for the men. It is exhausting work.

by **John and Kim Shumlansky**, Mount Kenya National Forest, Kenya

Each family in our village has a water tap near their home. Therefore, each family is responsible with managing the amount of water they use.

In Kangaita and in much of Kenya, it is usually the responsibility of women and children to get water for the family. They usually collect the rainwater off a roof or simply fill buckets and pots from the nearby tap. If the water system breaks down and it has rained recently, then the children and women go to the nearby stream and collect water in jerry cans.

Men are now assisting more with the responsibilities previously handled by women, but women are predominantly found washing clothes, cooking, and cleaning around the house. The men in Kangaita are responsible for farming, building, and home repair chores. The men irrigate their gardens using the water supplied by the community water system. Some of the families even use a homemade sprinkler that allows them to irrigate large areas of their garden during the dryer season.

by **Melissa Perry**, Oyugis, Kenya

There is no formal system for water management in my town. The boys who deliver water on their bicycles are individuals working for themselves.

There was piped water in my town but since I've been in Oyugis there has not been piped running water. Many homes are equipped with faucets, showers, etc., but they don't work.

Farmers usually try to plant near a river or stream so they can easily fetch water for their crops.

by **Bryce Sitter**, Mobile Clinic, Kajiado, Kenya

There is no farming, except a few places in the district where irrigation is possible from wells. The district water engineer is in charge of gazetted water schemes. In the home, the woman fetches the water and does all domestic duties involving water. The wife gives the husband a gourd of drinking water when she returns home. Women actually have dents in their heads where leather straps from carrying water have shaped their skull. Young men guard the water sources; these duties are often passed down from generation to generation.

by **Barbara Hinsman**, Vigeze Village, Vihiga, Kenya

In Kenyan families the woman is fully responsible for managing water supplies. Mama decides how much water is needed for the day, and then she either goes to fetch it herself or she sends the children. Girls are most often seen collecting water, but boys can also assist when needed. Then Mama delegates how much water is needed for each task. Typical uses for water include drinking, cooking, washing floors, dishes and clothes, bathing, feeding livestock, and watering tree and vegetable seedlings. If, however, the family builds a water tank and roof catchment system, the decision, resources, and labor to build the tank must come from the man of the house.

Farmers in Vihiga rely on the rain rather than irrigating their crops in any way. Farmers fear too much rain and too little rain. They combat heavy rains by digging trenches to trap heavily flowing water, which is potentially harmful to crops, and by building well-secured terraces on their farms to prevent soil erosion. Lack of rain, on the other hand, is more difficult to deal with. If a water source exists nearby, farmers will water the more expensive crops, such as green vegetables and tomatoes, but maize, the staple food, will be left to dry. Fortunately for the Maragoli people, the dry season here is short, and both drought and famine are uncommon.

by **Patrick Campbell**, Mombasa, Kenya

Water in Kenya is managed by the ministry of water. In families it is generally a group effort, though the women play a more significant role. The men may use the water for bathing and perhaps irrigation, but women are responsible for cooking, cleaning, washing clothes, and supplying drinking water for the family.

Most farmers depend on the rain. Those near a source of water may practice some form of irrigation; others may dig a borehole that will provide water that is saline but usable in emergencies.

by **David Frommell**, Bagoo, Rift Valley Province, Kenya

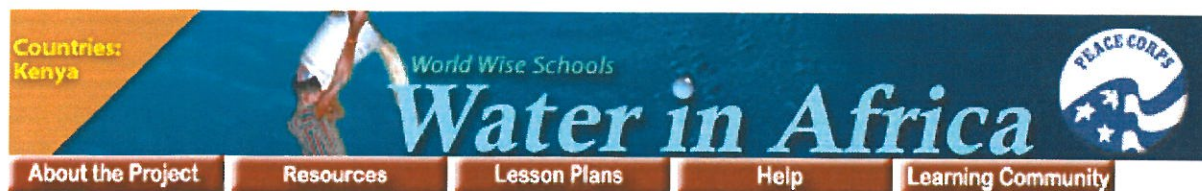
Water and its management are issues typically addressed by women in Kericho. The Kipsigis tribe is a patriarchal social unit. The woman's duties include fetching water, if necessary, for use in cleaning, cooking, and farming. The men, upon seeing a need, supply the women with the tools necessary for water-related work: water tanks, piping schemes, pumps, gutters for roof catchment.

Within Kerico Municipality, the town council manages the operations of the water works and distribution system. Tasks include treatment, maintenance, sales, and revenue collection.

Generally, farmers in Kerico District rely upon the ample rainfall to irrigate their crops. A drought results in famine, as does extremely heavy rainfall. Farmers in the drier areas of the District are beginning to design irrigation schemes using local rivers.

by **Glenna Snider**, Osorongai, Kenya

Women are responsible for managing water in my community. They collect it, cook, wash, and bathe their children. They are responsible for providing the men with water for drinking and bathing. Farming is managed according to the rains. Crops are harvested just as the dry season is beginning, and no crops are planted until the rains begin again. Food is scarce during the dry season. Farmers among the rivers have small-scale irrigation systems. The water is either piped to a small area, or a series of ditches can be opened to the river to supply water to small areas.



Conservation

by **Drew Denzin**, Ololulunga, Kenya

There is little to no conservation of water. People may keep rinse water or bath water to water gardens, but other than that most people rely on the availability of the river water. Most people do not even have gutters to collect rainwater, something that would save money and effort and give them cleaner water.

by **Kendall Rondeau**, Miharati, Kenya

I do not see a lot of conservation of water. I see a lot of waste. However, sometimes I see recycled water (that had been used to wash hands or dishes) thrown into the garden.

by **John and Kim Shumlansky**, Mount Kenya National Forest, Kenya

When you have enough of something, it is often difficult to use it wisely. Although our community was familiar with drought and had suffered through water shortages, we soon grew forgetful about the need to conserve water once the new community water system was built. At first we would find people, including ourselves, leaving taps running and forgetting to repair broken pipes that would leak for days. Time has now passed and we have once again realized that water is a precious commodity. People in our village are now directing spilled water from their taps to their gardens for irrigation. People are also making sure broken pipes are quickly repaired and that children know to turn off the tap when they are finished.

by **Melissa Perry**, Oyugis, Kenya

The biggest effort my community has made in conserving water is building roof catchment water tanks on their houses. Other than this, there is no conservation of water.

by **Bryce Sitter**, Mobile Clinic, Kajiado, Kenya

Water is carried from far off, and it often takes the whole day to do this task. Usually, every other day is spent watering the cows and filling jugs to be carried back home. Water is recycled as much as humanly possible. Sometimes water is used four or five times and by then it contains soups, dirt, grease, and food. When water gets scarce people move. Women carry water and also use donkeys to carry it.

by **Barbara Hinsman**, Vigeze Village, Vihiga, Kenya

Surprisingly, there is little conservation of water in Vihiga. During the dry season, when water is really scarce, people tend to use less water for washing clothes, watering plants, and cleaning the house. They also eat more fried foods, rather than boiled, and drink more soda and milk than water.

I see, in fact, that the opposite of conservation is taking place. A lot of rainwater is wasted during the rainy season, which, if collected and stored properly, could be available during the dry season.

by **Patrick Campbell**, Mombasa, Kenya

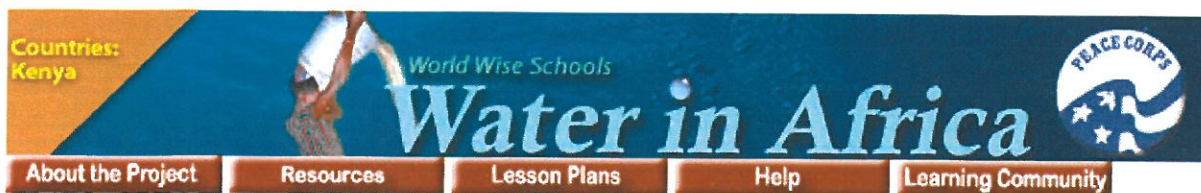
People conserve water out of necessity. The supply is limited, and so what little water you have must be stretched to meet your needs. One of the most common forms of recycling (or reusing) water is to use water from rinsing clothes to wash the floors afterward.

by **David Frommell**, Bagoo, Rift Valley Province, Kenya

Water conservation occurs on a small scale in rural homes. Water used for laundry may be used again to wash floors, while water used to wash hands before meals is reused to wash dishes. Families with running piped water are less likely to conserve or recycle water than are families that fetch water manually from a nearby river, reservoir or well. As a community, the people of Kericho Town employ a modern wastewater treatment facility. The treatment plant collects water from combined sanitary and storm water sewers, treats the water with physical and biological methods, and discharges the clean water to the nearby river. (Physical treatment involves letting solids settle. Biological treatment involves stone filters and aeration). This type of modern sewage treatment is uncommon for towns like Kericho in Kenya. Revenue from local tea growers and donations from international sponsors help to fund such modern undertakings.

by **Glenna Snider**, Osorongai, Kenya

There is no conservation of water that I have observed.



The Environment and Agriculture

by **Drew Denzin**, Ololulunga, Kenya

The quality of water in our village is extremely poor. Water is not looked at as something that can be polluted. Thus, the locals will often bathe and go to the bathroom in the same place where they collect water for drinking and cooking. Cattle have also polluted the river with their manure. In addition, erosion is taking place, due to planting crops on soil that cannot support them. With poor soil quality, a heavy rain easily washes out the crops. With dirt roads that are washed out by rains, all the silt goes directly into the river.

by **Kendall Rondeau**, Miharati, Kenya

Farms around this area have joined in huge water projects benefiting hundreds of people per project. They have built intakes in the mountain rivers, bringing piped water to many farmers. Although this seems like good development and progress, especially helping women, I have noticed some detrimental effects. The river water is not measured or monitored. Anyone who has money can join a water project and so, as time passes, more and more people are drawing on the rivers. Some rivers have become seasonal from too much use. They dry up in the hot months when we have no rain.

Another detrimental effect is that farmers along rivers and streams farm right up to the very edge of the waterways. They do not follow the law requiring eight feet of natural, indigenous vegetation to be left along the river edges. This farming up to the banks of the rivers leads to erosion, especially following hard rains (which we have almost daily). The rivers are filled with silt and chemical runoff, damaging the water quality as well as its plant and animal life.

These contaminated rivers flow for miles and miles, picking up more contaminants as they pass through farms and towns. People who drink directly from these rivers often get sick. The main illnesses are typhoid and worms.

by **John and Kim Shumlansky**, Mount Kenya National Forest, Kenya

Our water originates within a protected national forest. The pipeline then flows through a government-owned tea plantation to Kangaita. No major changes in the community or the environment have affected the quality of the water.

by **Bryce Sitter**, Mobile Clinic, Kajiado, Kenya

We are suffering from contaminated water in many sources. The water contains fecal matter from cows and humans. Sources are not always protected, and animals defecate in the water. This spreads germs and disease. We lost 12 people due to cholera in a village to the south of me. This is directly linked to water.

A few small-enterprise businesses have started here in Kenya. A large tanker truck does waste disposal of pit latrines with a large pump. Unfortunately, there are no regulations on dumping, and wastes are dumped next to streams and foot trails, where they get into contact with people. There are also flower and chicken farms popping up in the area. This is because labor and land are cheap. There are no regulations on dumping or chemical use, and so these farms also pollute the ground and water. They even had the fluoride and chlorine taken out of the water because it wasn't good for their flowers. Those two chemicals are put in water to kill germs in the water and to protect your teeth. We also don't have the money or resources to fix or maintain wells and pumps. If they break down, they often sit that way for a long time.

by **Barbara Hinsman**, Vigeze Village, Vihiga, Kenya

Two major environmental concerns, which have greatly damaged water quality, are deforestation and agriculture. For the most part, agricultural techniques in Vihiga are low input and low impact, especially compared with those in the United States. Still, farmers regularly use fertilizers and pesticides, which eventually end up contaminating the watershed. In addition, soil erosion from cultivating Vihiga's steep hills increases sedimentation in the rivers.

The problem of soil erosion is augmented by the dangerously high deforestation rate. Hills that were covered with indigenous forest three years ago are now bald, with no trees left to prevent the soil from washing into the rivers to be deposited in Lake Victoria. To compensate for the lack of fuel wood, the Maragoli people plant blue gum trees, of the Eucalyptus species. Unbeknownst to most Maragoli, these trees require a lot of water. A popular place to plant trees is near rivers, where the land is too swampy to cultivate. Now these "swamps," or wetlands, no longer exist due to the eucalyptus trees that drink up all the water. This is very unfortunate, considering that wetlands are natural filtering and cleansing systems for watersheds.

Damage to water quality by deforestation and agriculture is greatly exacerbated by population expansion. With a population density of over 1,100 people per square kilometer, Vihiga is incredibly overcrowded and still growing. As the numbers rise, water quality declines even further, due to more human and livestock waste, more garbage thrown on the streets, more land being intensively farmed, more agricultural chemicals being used, and more trees being felled. So far, the only steps I've seen taken to increase the availability of clean water (not necessarily to actively improve water quality) are protecting springs and building pumps to access groundwater before it becomes severely contaminated.

by **Patrick Campbell**, Mombasa, Kenya

The supply of water has not kept up with demand. The system in place to supply water was not designed to support a population of 500,000 people. Ninety percent of the time I have water only until 9 a.m., and then again at about 8 p.m. Maintaining the system is also an issue, which is made more difficult by people who break pipes to steal water as they do not have an adequate supply in their area.

Treating the water has helped to create a decline in the spread of waterborne illnesses. However the treatment is sometimes inadequate. The lack of water causes people to turn to sources that are less safe. The result is that there are still outbreaks of waterborne illnesses.

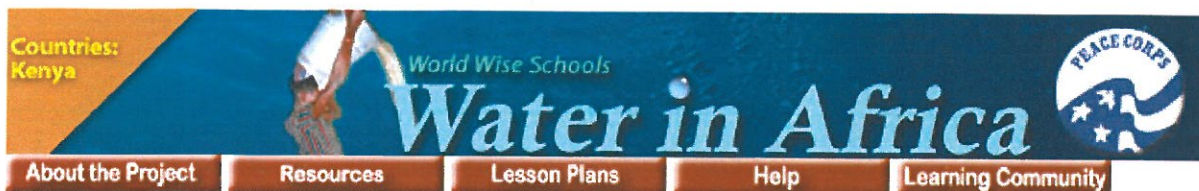
by **David Frommell**, Bagoo, Rift Valley Province, Kenya

Long before any of our grandparents were in school, tropical forest and lush marshland covered the hills of Kericho District. The Kipsigis tribe lived among the hills, herding cattle and producing indigenous crops. During the early 1900s, European missionaries arrived in Kenya at the forefront of a powerful wave of white settlers. This event forever changed the landscape of Kenya, and Kericho District in particular. The foreign settlers noted the high potential of Kericho as a tea production area. The abundant rainfall, cool temperatures, and morning sunshine were perfect for the sensitive tea bushes. Companies such as Brooke Bond Kenya and African Highlands began clearing the forest and planting acre upon acre of tea. Today hundreds of square kilometers of land rest under a monoculture of some of the world's finest tea bushes.

Establishment of the tea industry came with benefits and drawbacks. Many jobs, high income, and increased education helped the people of Kericho to become comparatively wealthy among Kenyans. The district's surface waters suffered, however, from increased siltation caused by deforestation. Chemical fertilizers and pesticides now make the once clean waters appear grayish brown. Dams and water intakes restrict water flow, resulting in algae blooms on the slow-moving waters upstream of such structures. Today the tea estates make considerable efforts to pursue organic tea farming techniques. The establishment of Kericho as an economic center, however, and the explosion of agriculture in their fertile region, continue to damage the waters. Today the people of Kericho have need for sophisticated water and sewage treatment facilities to clean the waters of what used to be a clean, natural water system.

by **Glenna Snider**, Osorongai, Kenya

Many people are aware that clean water is important to good health, but it is difficult to put into practice. Women are mainly responsible for all the chores, including collecting firewood for cooking. It becomes difficult to find the time to boil drinking water, so they just drink the water directly from the rivers and dams. New technologies have had little effect on my community.



Health and Nutrition

by **Drew Denzin**, Ololulunga, Kenya

Our drinking water is not fresh, and many people (including our students) take no precautions to make sure it is safe. Many times we have seen our students dip their cup in the river and drink it. They don't believe that it can make them sick. Our community does nothing to purify the water, though some more educated people use chlorine or boil the water before drinking or cooking with it. Many people do not invest in gutters and tanks to collect rainwater. Most just go to the river for water (which is something Jen and I can't understand). While rain is scarce, the water is much cleaner.

Our water is contaminated by pesticides from nearby large-scale farms, manure, human wastes, erosion of soil—just about anything you can think of. Many people rinse out petrol cans in the river as well. Most people here seem to have amazing immune systems. But waterborne diseases and sickness from contaminated water are common.

by **Kendall Rondeau**, Miharati, Kenya

Those who have piped water have fresh water. That water comes straight down the mountains and is hardly contaminated. But there is a village of squatters in Wanjohi that is very poor. They fetch from the Wanjohi River, which comes a long way through farmland before heading toward the Wanjohi town. Health officials here often comment that the villagers "let the silt settle down to the bottom and then say the water is clean!" Typhoid outbreaks are common. Obviously they are not boiling their water; if you ask, however, they'll assure you that they are. Fortunately most people drink only chai—a hot tea which requires boiling. Otherwise I think there would be more typhoid outbreaks.

Many days walking home I see small children (and sometimes even adults) stop at the river for a quick drink. Schoolchildren fill their water bottles. I try to explain about typhoid, but usually the people just shrug at me and continue to drink.

by **John and Kim Shumlansky**, Mount Kenya National Forest, Kenya

Our water is fresh and clean but it is not treated enough to remove all the possible disease-causing organisms. The intake structure contains a series of screens and filters that removes the larger particles of dirt, stones, and debris from trees and other vegetation that fall into the stream. It also keeps crabs, insects, and even frogs from getting into the pipeline. Unfortunately the screens are not able to keep out the microscopic organisms from animal

droppings, insects, and bacteria. Therefore many people in the village take the precaution of boiling all drinking water.

Some people still feel immune to disease and drink the water directly from the tap. Since the water appears clean they believe it is healthful. It can often take some time before everyone learns that clear, clean-looking water doesn't always mean that the water is free from disease-causing microorganisms. Drinking and bathing in contaminated water can result in illnesses that can keep people from doing their work and making a living. Contaminated water can also cause death and greatly impact the development of our community.

by **Melissa Perry**, Oyugis, Kenya

My water usually comes from a spring that is protected and well maintained by the Kenya Red Cross, so it should be fairly safe drinking water. However, I still boil my water and then filter it. Most of the families in my area boil their water for drinking.

Since I've been in Oyugis, there has been a small outbreak of typhoid fever, which comes from water. There has also been a cholera outbreak. Cholera causes severe diarrhea and it can lead to death within a few days. This more often affects people in the very rural areas.

by **Bryce Sitter**, Mobile Clinic, Kajiado, Kenya

The goats and cows can't get nourishment from the grass; they don't give milk and are susceptible to disease. We constantly get boils, scabies, and other skin problems from not properly washing. We must boil our water, and a few filter it. The spring of Kilimanjaro is surprisingly clear, but it runs through miles of pipes before I see it. The Maasai have lived here for years and years and still can't be convinced to boil or filter the water. Their immune systems have adapted, and they are very tolerant of living with worms, stomach bugs, and other waterborne diseases. When collecting water, they simply scatter the green algae at the surface and fetch the water just under the surface. It is rude to reject a gift offering of tea called chai, and I have been sick from drinking bad water or eating uncooked meat. I'm surprised, though, how much more tolerant of sickness I've become since coming here.

by **Barbara Hinsman**, Vigeze Village, Vihiga, Kenya

Although tap water and rainwater look, smell, and taste clean, I boil and filter water from both sources, just to be safe. Surprisingly many Kenyans in my area also boil their water before drinking it, but filtering is uncommon. I have heard some mamas complain that to boil water takes too long and requires too much fuel. This explains the high incidence of dysentery among Kenyans. I once heard that one-third of Kenyans have permanent amoebic dysentery without even realizing it, due to its cyclic nature of making one feel sick for a few days and then fine for a few weeks before becoming active again. Drinking river water can be especially dangerous, because both human and livestock waste, plus various chemicals from surrounding farms, contaminate it. I was told by a friend never to eat

sugarcane (which is eaten raw) that grows near a river, because I will become sick. Even cattle that graze near some rivers can become very ill.

Most people here do know the importance of clean drinking water. Many women and children walk long distances daily to a clean water source, such as a protected spring, rather than use the river water that runs through their backyards. Rainwater is considered to be very clean. Families often save their money for years in order to build a roof catchment system, which collects the rain in gutters and directs it to a large storage tank. If water becomes a concern throughout the community, villagers will sometimes pool their resources and, often with the help of a nongovernmental organization or another aid organization, they will collectively build a water pump and storage tank for use by all.

Those who have access to clean water are usually generous with it as well. One of the farmers I work with, Mr. Edalia, owns one of the only water tanks in his village. During a time of drought, or on any occasion when large amounts of water are needed (like a wedding or funeral), Mr. Edalia graciously allows other villagers to come and collect water from his tank. He claims his 1,000-liter tank stores enough water to supply his family year-round, plus a little extra for the community when needed.

by **Patrick Campbell**, Mombasa, Kenya

The piped water in my area is treated, making it relatively safe. Many of us boil our drinking water as an added precaution. The two most common forms of contamination here are from sewage and salt water. Contaminated water affects people who are limited in their options and sources of water.

by **David Frommell**, Bagoo, Rift Valley Province, Kenya

The water works in Kericho Town draws water from a freshwater river in the Mau Forest, a gazetted (protected) forest. The community takes great measures to ensure a clean water supply. The forest intake is 15 to 20 kilometers from town, deep in the forest; the treatment works sits about 13 kilometers from the town center. These distances prevent contamination by pollution from farms and industries.

The Mau Forest is owned and protected by the government of Kenya. Development, farming, and tree harvesting are forbidden by law within the forest, which lies almost entirely within Kericho District. The treatment works was built at great expense, considering the distances involved for moving water. A German corporation sponsored and funded the multimillion-dollar construction project, which is now managed by the town council. The Kericho Town's progress, in matters related to clean water, is immeasurable.

Unfortunately, the municipal water supply fails to reach every home in the district. Many families are forced to use local streams, wells, and springs for their water needs. Many communities form self-help groups, which undertake water projects to protect local sources from contamination or to construct rooftop rainwater catchment systems. Such groups make direct investments of money, time, and sweat to provide themselves and their children with clean water.

Families that cannot afford to invest in protected water supplies use water drawn from sources that may be contaminated with pesticides, viruses, bacteria, or protozoa. Those with enough resources boil their water using wood, kerosene, propane, or charcoal. Others drink unboiled water, commonly resulting in illnesses such as cholera, typhoid, giardia, amoebic dysentery, and other forms of dysentery. Such diseases claim many lives and adversely impact Kericho's productivity, whether measured in school days, agricultural output, or work hours. Although my local community is blessed with well-designed water facilities, much work is needed to ensure a safe water supply for the entire district.

by **Glenna Snider**, Osorongai, Kenya

Most of the water supplies in my area are contaminated. Animals are free to drink from the water sources, and there are no safeguards to prevent other wastes from washing into the water collection points. There are many families that do not have pit latrines, so human waste is also a problem. It is very important that public health workers live in communities such the one where I live, so they can teach on a daily basis the importance of water sanitation.



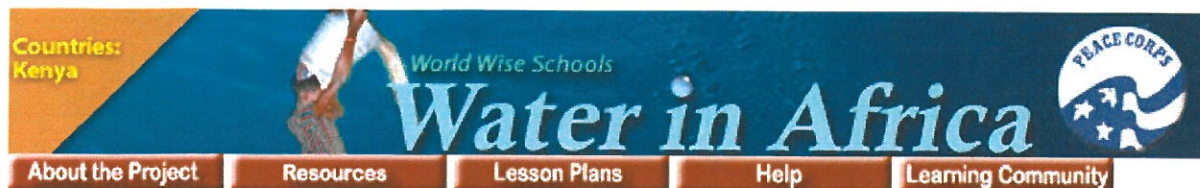
Other Uses of Water



by **Glenna Snider**, Osorongai, Kenya

There are no water sports. The rivers are strong and deep; most people fear the fast current, because they have never learned how to swim.

Young children enjoy bathing in the hot sun, using water their mothers have put in basins. They really enjoy their baths when they have soap!



Recreation

by **Drew Denzin**, Ololulunga, Kenya

Water is used only for bathing, drinking or cooking, and watering cattle. We have not seen anyone enjoying the river recreationally. Children entertain themselves in other "land locked" ways.

by **John and Kim Shumlansky**, Mount Kenya National Forest, Kenya

It is rare to find children playing in the streams by our village, because the water is too cold. Kangaita is located about one degree south of the Equator, but is also at about 9,000 feet above sea level. At this elevation, Kangaita is one of the coldest inhabited areas in Kenya. Furthermore, the water in the streams by Kangaita originates from the glaciers on Mount Kenya, and the water does not warm up much on its short journey to our village. The temperature of the water helps to keep it clean, but it is way too cold for children to play and swim in.

by **Melissa Perry**, Oyugis, Kenya

Since water is sometimes scarce in my community, children don't play games with water. Most small children are brought to a stream nearby with their mamas and they bathe in this stream. During this time the children swim and play in the water.

by **Bryce Sitter**, Mobile Clinic, Kajiado, Kenya

The last time it rained I did see kids playing in some water. It is also one of the few times I saw cars being washed.

by **Barbara Hinsman**, Vigeze Village, Vihiga, Kenya

I rarely see water being used for recreation by Maragoli people. In fact, many people I know are afraid of water and do not know how to swim. This may be due to the lack of ponds and lakes in the immediate area. It is interesting to compare the Maragoli to the Luo people in that respect. The Luos, who have lived on the shores of Lake Victoria since they arrived in East Africa thousands of years ago, are fond of water. Every time I go to Kisumu, a nearby city on the lake, I always see naked Luo children splashing about in ponds by the side of the road. When Maragoli people who live only 20 km (13 miles) away see this, they

think it is very funny and inappropriate behavior. I imagine the Luos also laugh when they learn of Maragolis who are afraid of water and swimming. It is amazing to think that these two tribes still have opposite personalities despite the fact that they have lived in such proximity to each other for so long.

by **Patrick Campbell**, Mombasa, Kenya

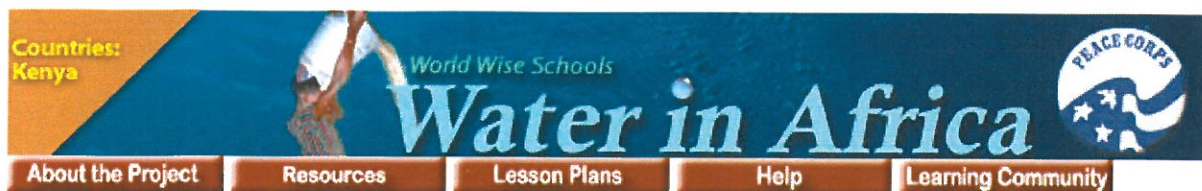
Living on the ocean, many people will, of course, swim. Most of the water recreation on the coast is enjoyed by tourists who have the time and the money to sail, windsurf, snorkel, and dive.

The locals fish, but more as a source of food and income than of recreation.

by **David Frommell**, Bagoo, Rift Valley Province, Kenya

Water-based recreation is uncommon in Kericho District. In rural communities where the local water source is the nearby river or stream, children can often be found bathing and splashing in the water.

Kericho Town boasts only one operational swimming pool, which is fenced in at the exclusive Tea Hotel. Built by the Brooke Bond Kenya tea company, the luxurious hotel sits above the Brooke Bond tea fields, approximately one kilometer from Kericho town center. The hotel, originally used by the white owners of Brooke Bond to house visitors from the United Kingdom, is now owned and managed by Kenyans.



Transportation

by **Drew Denzin**, Ololulunga, Kenya

Our river, which varies greatly in depth between the rainy season and the dry season, is a tributary of larger rivers. Transport isn't possible on it.

by **Kendall Rondeau**, Miharati, Kenya

People here do not use the river for transport or travel. Instead, they use it as a car wash. A lorry (truck) will pull up into a shallow part of a river and five guys will jump out and begin washing. Oil, grease, and dirt float downstream. People also wash their bikes in the rivers because our roads are extremely muddy and bikes become clogged with mud. I've washed my bike in the river a few times. You have to be quick, though. The water is so cold it numbs your hands and feet!

by **Melissa Perry**, Oyugis, Kenya

I live near Lake Victoria—inland about 30 km. Many of the people in my community go to the lake to purchase fish to resell. There are many fishermen on Lake Victoria. In the bay areas, the fishing boats are used to transport goods and people to surrounding areas.

by **Bryce Sitter**, Mobile Clinic, Kajiado, Kenya

Kajiado means the long river. I have never seen water in it though. The cement factory harvests sand and limestone from the dry riverbed, and for certain seasons one can dig deep in the riverbed and access water as it seeps through the sand. I've been told that during El Niño, this area saw rains that were not of normal amounts, and the river could not sustain them. Many people were caught in the flash flooding as bridges washed out. The soil could not absorb the water, as it is too rocky.

by **Barbara Hinsman**, Vigeze Village, Vihiga, Kenya

I live about 20 km (13 miles) north of Lake Victoria, the second largest freshwater lake in the world (in surface area; Lake Superior is the largest). The Maragoli people who inhabit the rocky hills of Vihiga have a spectacular view of the lake, yet few take advantage of its existence so nearby, and most have never walked on its shores. The Maragoli do make use

of various streams in Vihiga, which feed into Lake Victoria. None of these waterway are large enough for transportation however.

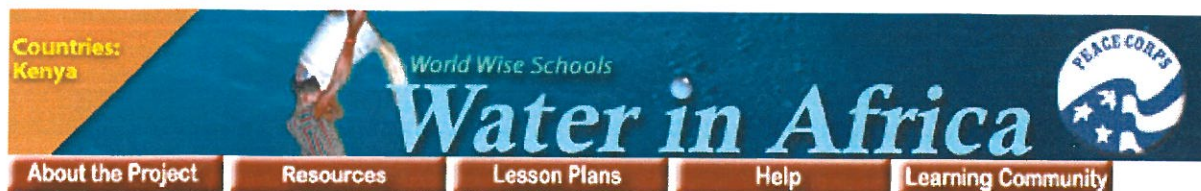
A different tribe of people, the Luo tribe, live on the shores of Lake Victoria and use its waters in their daily lives—for drinking, bathing, fishing, and transportation. Unfortunately these activities, especially transportation and fishing, have been greatly inhibited by the water hyacinth, an exotic plant that reproduces very rapidly, keeping boats from passing. An American environmental firm has just arrived to mechanically remove this water hyacinth, which should free the water again for the Luos to carry on with their traditional lifestyles.

by **Patrick Campbell**, Mombasa, Kenya

Mombasa is the major port for East Africa. For centuries it has been a center of trade. From Vasco da Gama explorations to the importation of vehicles today, the port has long been a center of activity. Looking out across the sea, you can see fishing boats in the distance and huge trade ships from all over the world on the horizon.

by **David Frommell**, Bagoo, Rift Valley Province, Kenya

Among the hills of Kericho District run many rivers and streams. Natural springs arise along hillsides and rock outcroppings. Kericho's waterways remain too small for transportation purposes, however. The only man-made things transported by the rivers are trash, chemical pollutants, and sediment carried by erosion from improperly maintained farms and roads.



Other Stories

by **John and Kim Shumlansky**, Mount Kenya National Forest, Kenya

It was an exciting time when our new water system was finally finished and water began flowing to the village. This excitement continued for about a week before we woke one day to find no water in the pipes. As the children went out to the stream with their jerry cans to collect water, a few of the village men accompanied us into the forest to see what had caused the water to stop running. As we followed the buried pipeline through the thick forest growth, we came up on an area where trees were uprooted and the ground was completely overturned. Elephants had apparently come through the night before.

The pipes had been properly buried so that nobody would mess with them, but they had not been safe from the herd of 20 to 25 elephants that had come sliding down the hill, one after another, each taking away more and more of the dirt that covered our pipes. The pipes lie halfway down a steep hill and thus the weight of the sliding elephants and the slope of the land had soon eroded the one foot of dirt that protected the pipes. Once the pipe was uncovered, it was inevitable that it would be shattered. When we arrived at the scene of the elephant crossing, a large footprint could be seen over the broken spot where water was pouring down the hill.

The following day we called together about 30 members of our village to re-bury the pipeline. This time we made sure that at least three feet of dirt covered every part of the pipeline. Burying the pipeline for a second time was hard work, but certain precautions are necessary when you live among elephants.

by **Melissa Perry**, Oyugis, Kenya

As you look at the names of the people in the pictures you will notice many have the same name. The tribe in my area is Luo; they are considered fishermen since they come from the lake area. The Luo tribe names their children by the time of day they were born. My Luo name is Atieno because I was born late at night. A girl's name starts with an A and a boy's name begins with O.

by **Bryce Sitter**, Mobile Clinic, Kajiado, Kenya

Kenyans can buy second-hand clothes, tools, and devices, and are always willing to accept anything. They are very good at fixing things and getting by without things we rely on.

Learning to live here meant learning to go without things I thought I needed. But, it is also considered rude to write a note or letter on the back of "scratch paper." Likewise, a new plastic bag is given to a customer who buys fruits or vegetables in the market. There are no garbage bins or proper places to put trash, and plastic litters the area like an art exhibit. New modern conveniences like aluminum cans and cardboard are causing trash and littering, where a few years ago things were wrapped in banana leaves.

When you get into a car, it is likely to be a jalopy. Cars are repaired over and over. I've even held the door shut and watched the road pass me through holes underneath my feet. The Kenyans are so friendly, that it takes me an hour to walk the 4 kilometers (2 1/2 mi) to town, constantly greeting people. They are loving and social and very giving. They ask many questions about America. I was once asked if I have ever ridden in the space shuttle. Everyone knows your business, and if there is need, the community comes together to raise money, show respect, or help someone celebrate. Someday I will have to return here to see my Kenyan friends again.

by **Patrick Campbell**, Mombasa, Kenya

The handicapped in Kenya are severely disadvantaged by cultural superstitions and a social welfare system that is desperately underfunded. In Embu, a town two hours north of Nairobi in the foothills of Mount Kenya, I lived next to an orphanage, which was also a school for handicapped children started by the Red Cross. After a day of consulting business I would often come home and kick a soccer ball around to unwind. After a while I noticed I had an audience of children shyly peeking through the fence. In Swahili I invited them to join me, and two of the bravest crawled under the fence. One by one others began to sneak in and join us, and soon I was surrounded by a dozen laughing children. These kids receive daily reminders of what they can and cannot do as a result of their condition. I'm sure if they would have asked, someone would have told them they would never be able to play soccer. With no one there to tell them they couldn't, they decided to see if they could. They hopped, crawled, and limped around swinging their legs at the ball, hitting it with their crutches, or kicking it with their good leg, overjoyed by the chance to be kids. After six months in Embu I was informed that I was transferred to Mombasa. I wrote letters to family and friends asking if they had any soccer equipment they were able to donate to my friends. In the end they decided to donate money instead to avoid the logistics of shipping equipment 8,000 miles. On the day I left I presented the kids with 10 soccer balls and two pumps. I could hardly get them to stand still for two minutes so I could take a picture to send home to the donors. Now I live in Mombasa, a city of 500,000 people and I hardly ever get to kick the ball around anymore. Though I enjoy living on the coast and working with the handicapped, I often think of the friends I left behind in Embu. If I listen carefully, I can still hear their laughter.

by **David Frommell**, Bagoo, Rift Valley Province, Kenya

Late on a rainy Thursday night during May, I lay in bed with violent stomach pains and fever. Another Volunteer passing through town was staying with me, and was concerned enough to suggest we seek medical attention.

Near midnight, the neighbors I had known for only several weeks sprung into action, notifying the doctors and arranging for a vehicle to get me to the hospital, which was nearly two hours away. At 12:30 a.m. I waved good-bye to my new, sleep-deprived neighbors as my cab left the gas station.

When I arrived at the hospital at 2 a.m., the doctor diagnosed me with appendicitis. Six hours later I was flown to Nairobi, Kenya's capital city, for emergency surgery. That same day, my neighbors organized for a trip to the first hospital I had gone to that rainy night. They had no idea they would not find me there. Yet they spent hundreds of Kenyan shillings and a day of their time to show support to the young American man who had become their neighbor six weeks earlier.

I had not expected such sacrifice from the people of Kenya, who have little time or money to spare. Yet after living in Kericho for seven months, I have learned that such good deeds are common among my neighbors. I feel blessed to live in a community that values friendship so highly.

by **Glenna Snider**, Osorongai, Kenya

On January 1, I assisted a young woman with the birth of her baby, who was about one month premature. Here is an excerpt from a letter I mailed to my mother describing the event:

Sunday, Jan. 3, 1999

Dear Mom,

The past couple of days have been very eventful. I am taking advantage of the quiet, as everyone, or most everyone, is preparing to go to church. On Friday afternoon, Alex, and then Caroline, came to tell me that a young woman had come to the dispensary and that she was very sick. Raphael had gone to a wedding, so there was no one to see her. Alex and Caroline seemed unusually concerned, so I decided to find out where this woman was and if there was anything I could do to help.

She was kneeling in the grass, complaining of chest pains, and coughing. She was also pregnant, but not full term. I didn't really know what to do. After a few minutes, she said she needed to go to the latrine. As we stood up, she appeared to be having a contraction, and there was evidence that her water had broken.

Caroline ran to send someone to bring Raphael, and someone else to go for the midwife. I started walking with Helen toward the latrine. After a few steps, she suddenly cried out, lifted her skirt, and pulled at her underwear. I squatted down facing her, holding her hands, and told her to push. The placenta was already coming out; within about three minutes, a very small, motionless form slipped out onto the grass. I picked the baby up (a baby girl, although I did not know that until later ... no time to look). She was like a slippery rag doll. No sign of life; she was completely motionless. I turned her over onto her stomach, face to the ground, and gently whacked her backside—nothing. I flopped her around, pushed on her stomach and chest, trying get her to breathe. She remained totally lifeless. I called to Caroline that I needed help, that I needed to get the baby to breathe.

Helen was still squatting, watching, silent. I was hardly aware of her. The realization hit me at the same time that this baby might be stillborn, and that I wasn't going to get any help. In a kind of desperation, I opened her mouth and stuck my finger in, trying to clear a path, and trying to remember how to do mouth to mouth on someone that tiny. As I pulled my finger out, her mouth moved, in what looked like a reflex gag kind of movement. I started talking to her then—"Come on! I know you are alive, Breathe! Come on..." I put her over on her stomach, patted her back—nothing. I whacked her a little harder, as Caroline had returned, and was calling to me "Alex says to hit it hard on the back." People had started to gather, but were staying at a distance. I was vaguely aware of a couple of children very close, watching. I stuck my finger down her throat again, because it was the only thing that worked. She sucked in a small breath. I turned her over, patted her back, and then opened her mouth again with my fingers. She started breathing, very small, soft breaths. She did not cry.

I looked at Helen; we were still squatting in the grass, facing each other. I told her, "Your baby is alive." I called to Caroline that the baby was alive, and to bring a blanket. She ran to the house where Alex had put on a pot of water to boil and praying. Caroline told her to continue praying.

Rhoda, Helen, Magdalene, and a couple other village women came forward with cords and a razor blade. One old woman insisted that the mother had to dig a hole and bury the placenta. Caroline grabbed the jembe and started digging. I took Helen by the arm, lifted her up, and said, "She is coming with me." Rhoda had the baby. We brought them to my place and cleaned up the baby (who was still not crying, but was at least breathing). Helen bathed, and put on some clean clothes that Caroline brought over. We fixed a bed for Helen and the baby, on the floor in my room. The baby never cried until about 5 the next morning, and still had not nursed. I heated some water so Helen could wash her face, and cleaned the baby, who was wet. I gave Helen some *ugi* (porridge), then had her sit up in a chair to nurse. The baby finally started sucking; it was after 7 a.m., more than 12 hours since she had been born.

After it was all over, Alex told me that he had come out when the baby (later named Sharon Jepchumba) started breathing, and moved a group of children back. His daughter, Alison, had apparently been right at my side, and had seen the whole thing. He said, "She was really amazed. She just kept saying 'Mtoto, Mtoto,' over and over..." Helen and Sharon Jepchumba came to visit me two weeks ago. Sharon is now 10 months old. She is wide-eyed and chubby; a beautiful toddler. Her birth will always remain a highlight of my experience in Kenya.